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Choi

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(54) **SKIN AND SCALP MASSAGING APPARATUS USING ACOUSTIC PRESSURE**

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A61H 39/04 (2006.01)

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(58) **Field of Classification Search**
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(Continued)

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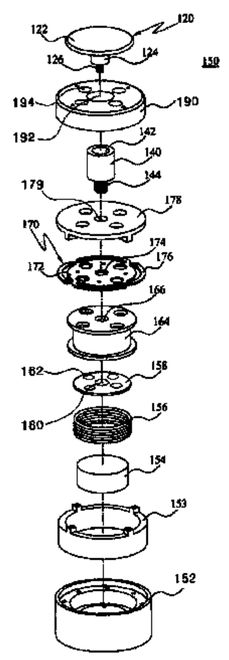
(57) **ABSTRACT**

A skin and scalp massaging apparatus using acoustic pressure. A vibration member generates vibration using acoustic pressure induced when a sound source is generated. A vibration probe is coupled to the vibration member to receive vibration. The vibration probe has a detachably provided head having various purposes. The head is provided to massage skin or scalp. The vibration probe is coupled to a cone paper damper for generating vibration through a connection member to which the vibration member is coupled. The vibration probe is coupled to the cone paper damper of the vibration member, so that vibration is directly received, and thus, the vibration efficiency can be improved. Further, the head for the skin massage or the scalp massage is detachably provided on the vibration probe, and thus, can be used for various purposes of, for example, massaging skin, scalp, or the like.

8 Claims, 7 Drawing Sheets



(58) **Field of Classification Search**
CPC A61H 2201/0153; A61H 2201/0157; A61H 2201/0165; A61H 2201/1207; A61H 2201/1666; A61H 2201/1683; A61H 2201/1685; A61H 39/007
See application file for complete search history.

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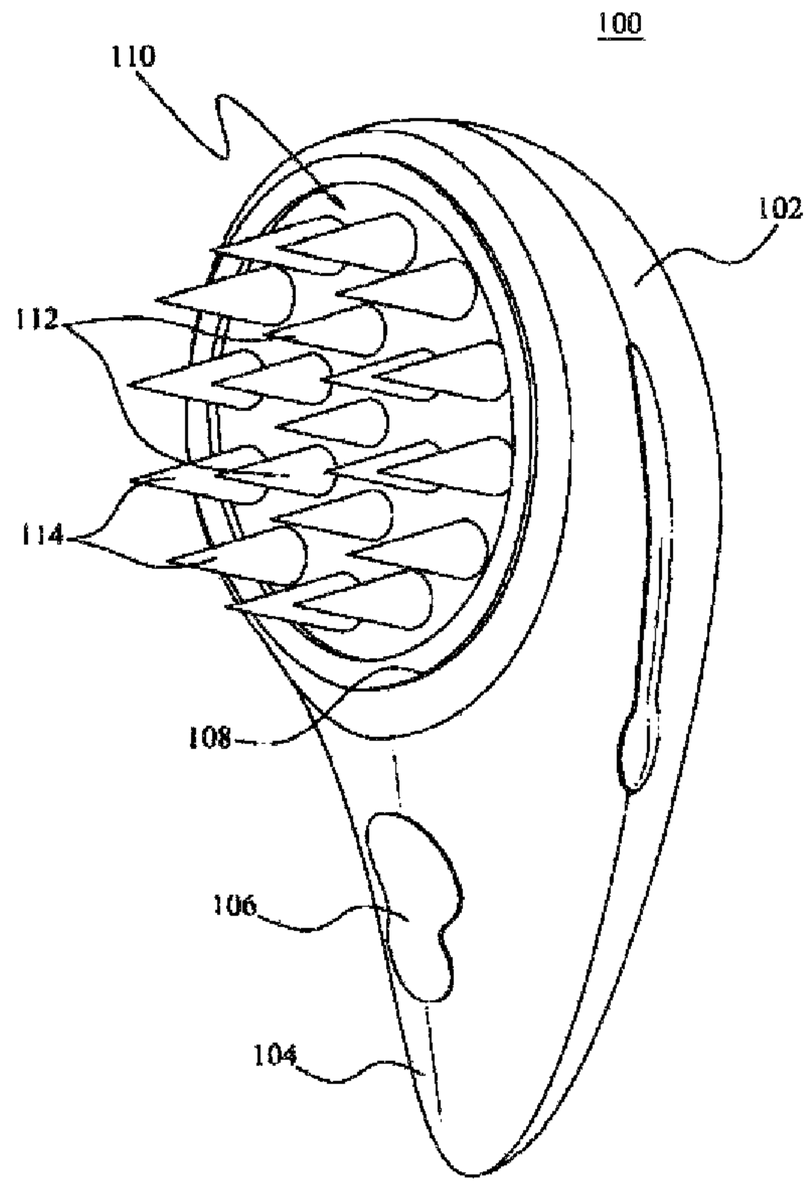
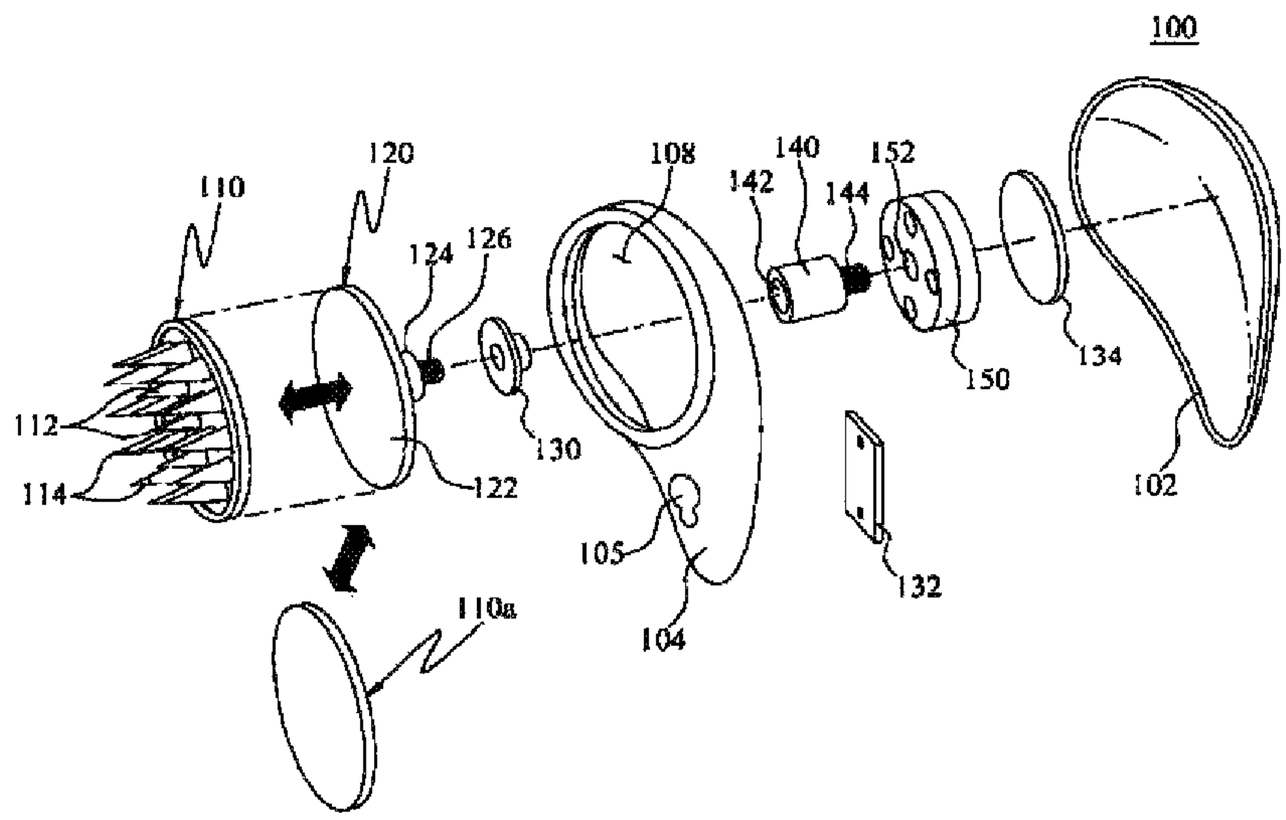
[Fig. 1]


100
110
102
112
114
108
106
104

[Fig. 2]


100
110
120
124
126
108
140
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144
152
112
114
122
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104
150
134
102
132
110a

FIG. 3

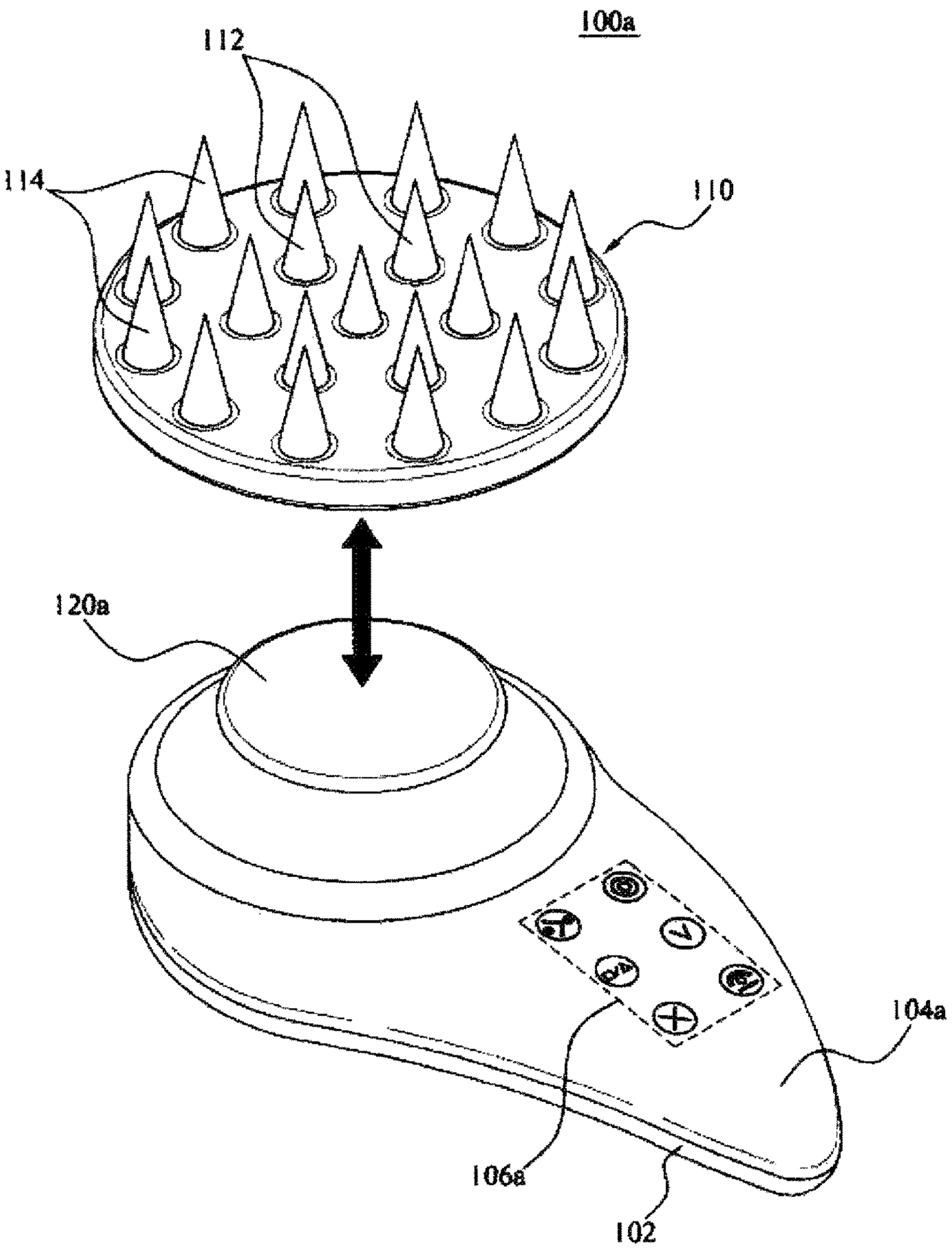
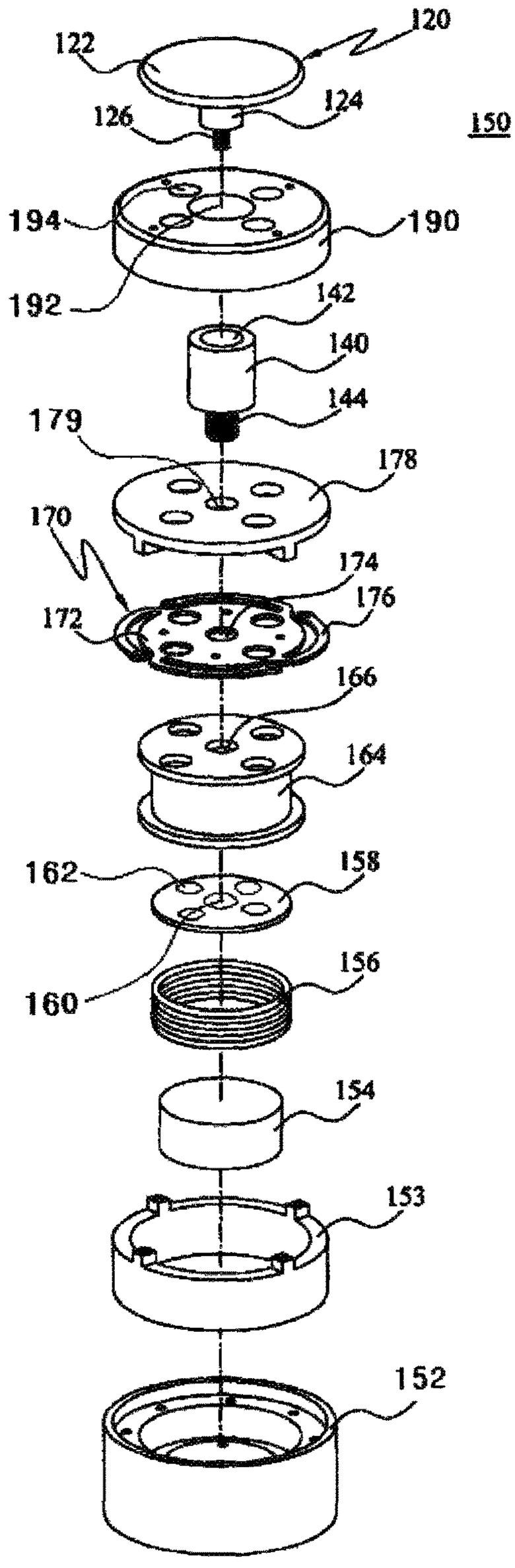


FIG. 4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122
124
126
150
194
190
192
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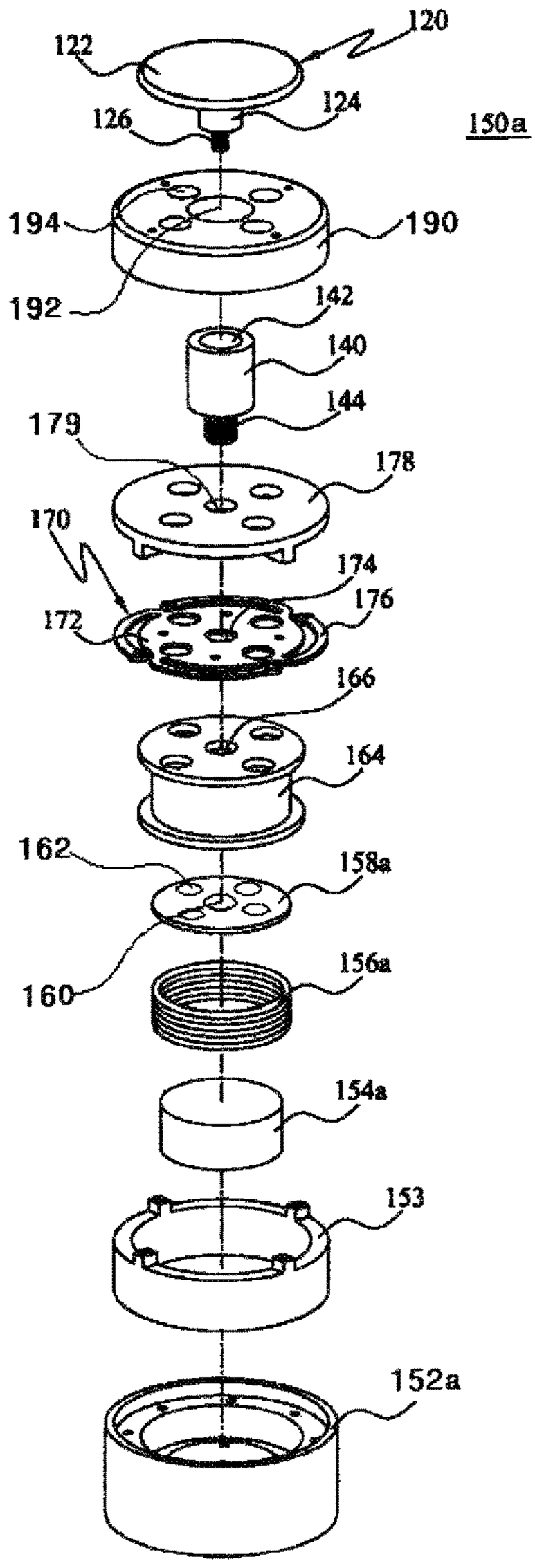
152

FIG. 5


120
122
124
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150a
194
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158a
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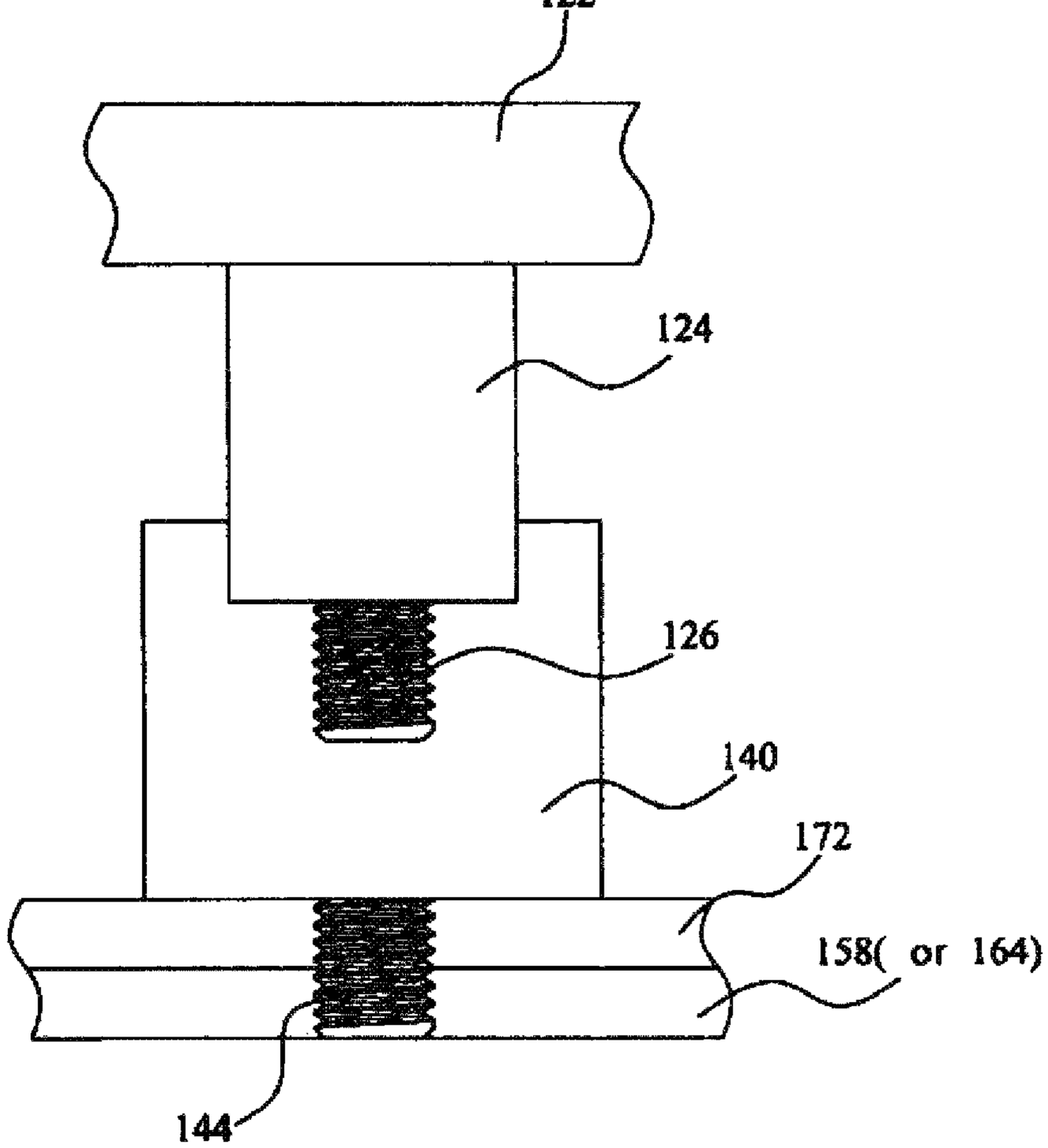
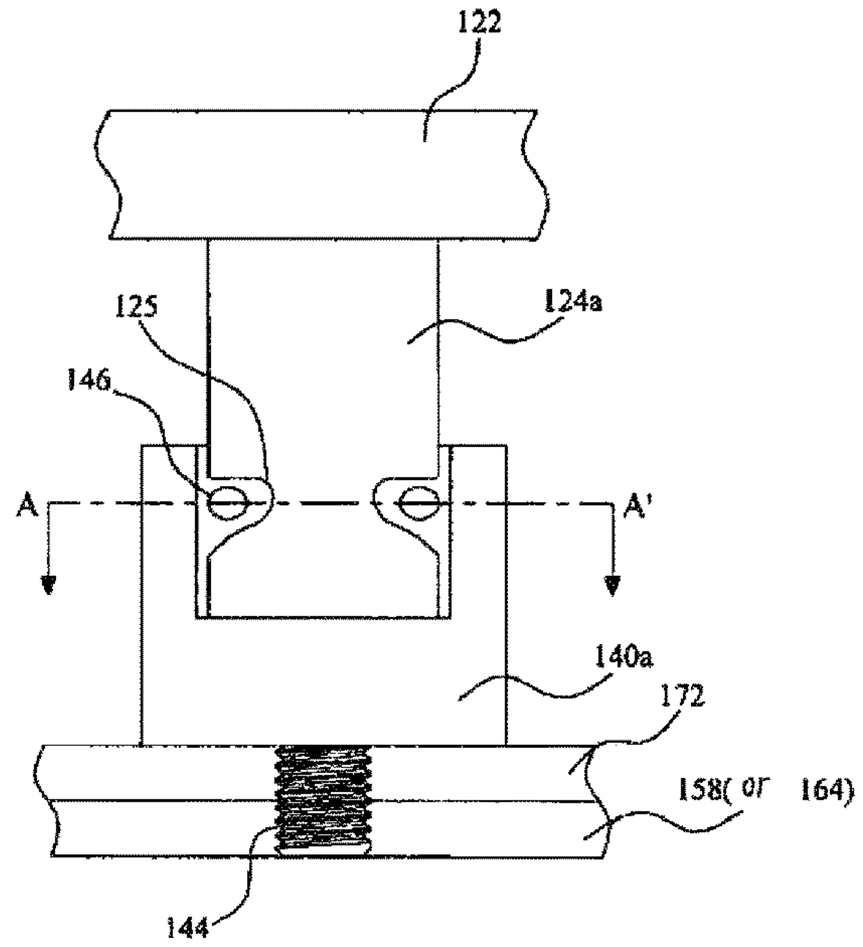
156a
154a
153
152a

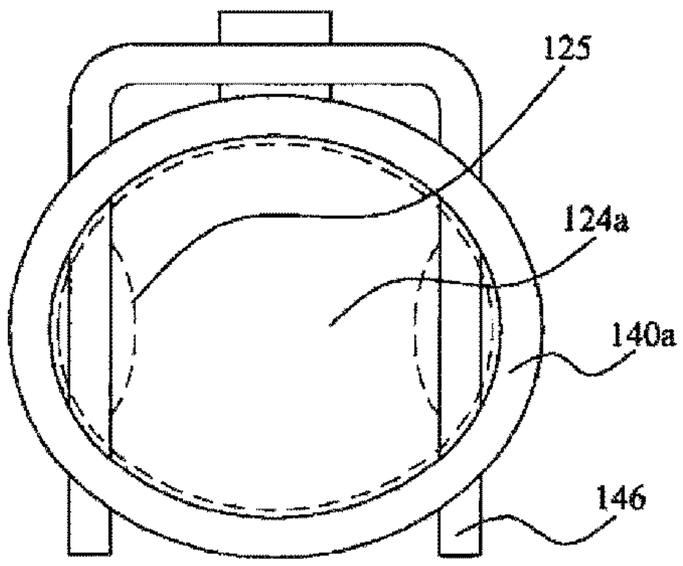
FIG. 6



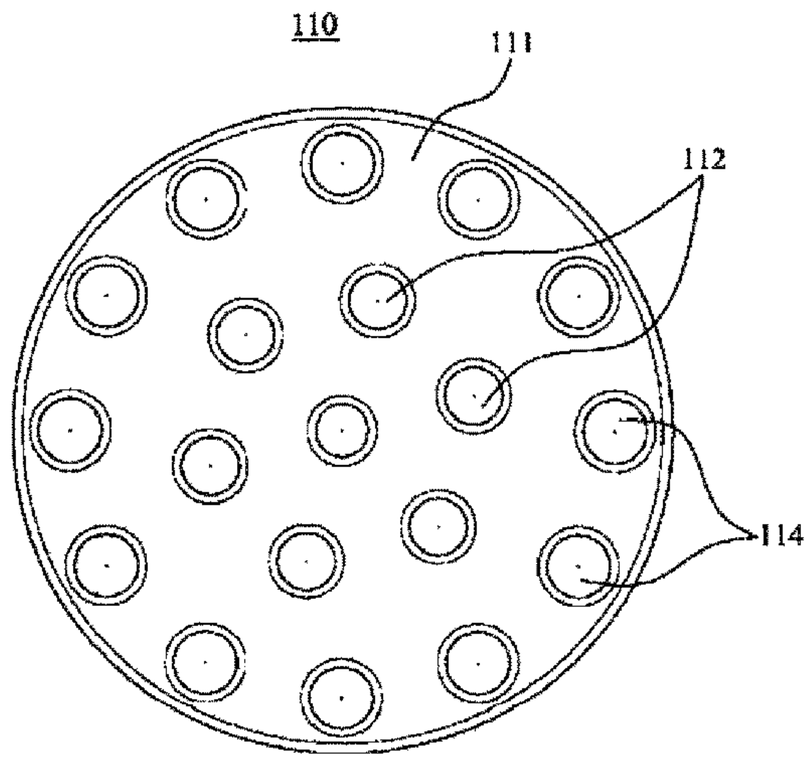
[Fig. 7a]



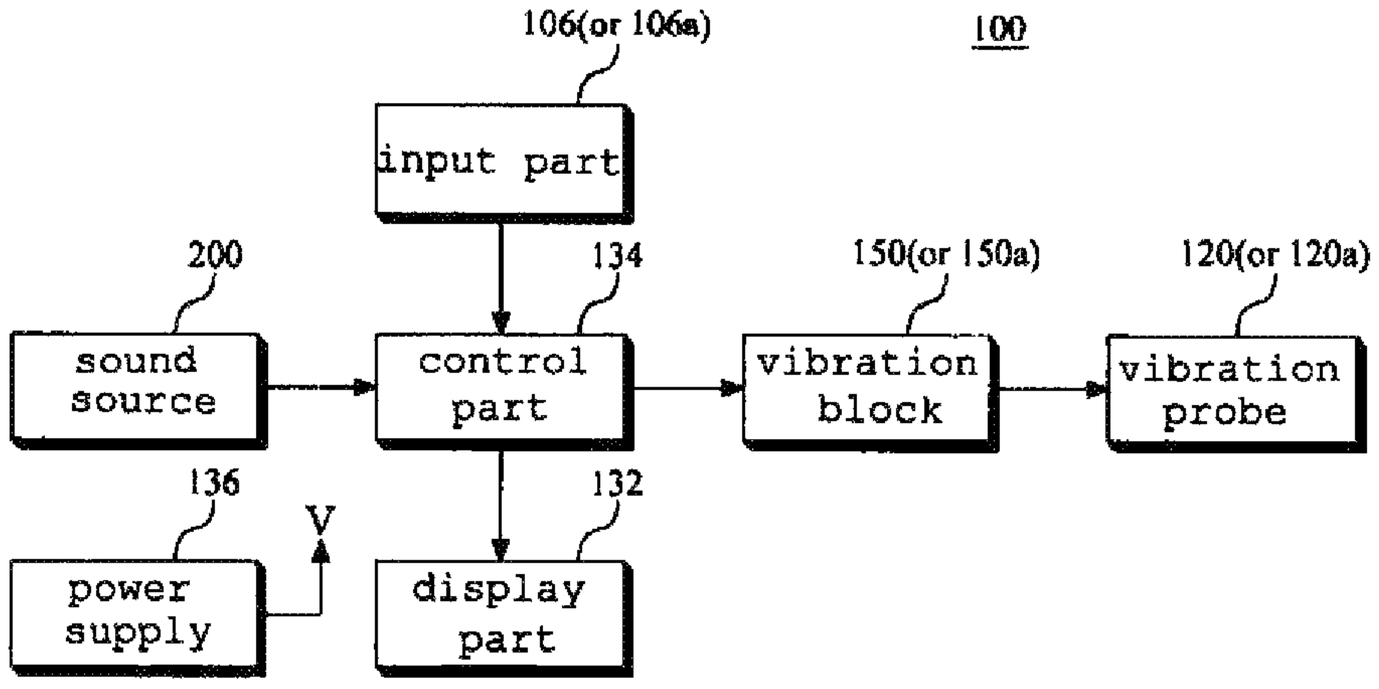
[Fig. 7b]



[Fig. 8]



[Fig. 9]


106(or 106a)
100
input part
200
134
150(or 150a)
120(or 120a)
sound source
control part
vibration block
vibration probe
136
V
132
power supply
display part

SKIN AND SCALP MASSAGING APPARATUS USING ACOUSTIC PRESSURE

TECHNICAL FIELD

The present invention generally relates to a skin and scalp massaging apparatus. More particularly, the present invention relates to a skin and scalp massaging apparatus including a vibration block using acoustic pressure induced when sound is generated, in which the skin or the scalp can be massaged by transmitting vibration from the central portion of a conduit damper of the vibration block to a vibration probe to which one of heads having a variety of applications can be detachably attached.

BACKGROUND ART

As human bodies age with the lapse of time, pains occur without injuries or diseases. Injuries caused by partial atrophies of muscles restrict activities. In addition, a variety of diseases, such as brain damage, myocardial infarction, atherosclerosis, and arthritis, are caused by restricted activities due to industrial and technological development, as well as traffic accidents, industrial disasters, sports injuries, and activity-involved simple disasters. Such diseases are also caused by a variety of complications due to stress, lack of exercise, obesity, etc.

In order to treat pains, damages, obesity, and the like occurring due to natural processes of humans or social and cultural problems as described above, not only medicines and health foods but also a variety of stimulating devices have been developed and are used. Such stimulating devices include a massaging device.

In general, a massaging device is a device to beat, rub, or stimulate the skin or the scalp in order to promote blood circulation, lipolysis, and waste discharge. Such a massaging device generates vibration or electric stimulation using electrical signals and applies generated vibration or electric stimulation to the skin or the scalp. For example, the massaging device is divided into a low-frequency massaging device that massages a human body by sending a low frequency current through the human body using electrodes attached to the skin, a supersonic massaging device that transmits ultrasonic waves to the human body using an ultrasonic probe contacting the surface of the skin, and a massaging device using an ultra-low frequency, far infrared (FIR) radiation, or the like.

However, currently-used technologies of stimulating human bodies using vibration include a large number of approaches that are currently applied and used. Examples thereof include a straight stimulus approach using a simple rotary vibration motor and a solenoid, a pressing method using air pressure, a stimulator inducing muscles to contract by inputting a low-frequency current thereto, a method of contracting muscles using a magnetic field, and the like. However, these approaches operate at a level in which pressure or stimulus is simply applied to human bodies, and the technological levels thereof are limited.

For example, referring to the structure and characteristics of a vibrator using a motor, it is possible to adjust the number of vibrations, but the amplitude or intensity of vibration cannot be adjusted. Thus, the vibrator may be erroneously used, causing injury to a human body. In addition, vibrations may not be rhythmically transmitted.

Recently, stimulation methods compensating for such problems by using a principle of audio speakers have been provided. However, such methods fail to realize a desired level of intensity that may be effectively felt, and merely provide a function similar to a subwoofer in a speaker system.

In addition, an approach using a low-frequency current, an approach using ultrasonic waves, an approach using high frequencies, and the like have been disclosed and used. However, the low-frequency approach may cause significant inconvenience to users, and in the case of the ultrasonic approach, a user may not readily feel an effect. In addition, since affected parts are exposed, a medium for transmitting low-frequency or ultrasonic vibration is required, which is a critical problem in use.

High frequency devices are directed to generating deep heat rather than functioning as stimulation devices. In addition, users may be subjected to a danger considering the characteristics of high frequencies. In the case of high-frequency devices, affected parts need to be exposed, and a medium is required. In addition, conducting plates used for transmitting electricity to opposite poles may be dangerous, and significant inconvenience in use is caused.

Low-frequency treatment devices repeatedly apply a pulse of low-frequency current to the skin. Thus, patients have an uncomfortable feeling of being electrically shocked while being treated, whereby the effect of treatment is reduced, which his problematic. In addition, low-frequency treatment devices required affected parts to be exposed in order to attach electrodes to the skin. Thus, female patients evade such treatment.

In addition, ultrasonic treatment and beauty devices transmit ultrasonic vibration to the skin when a skin contact area of an ultrasonic probe makes contact with the skin. However, there are a variety of problems. For example, when the probe contacts the skin in an erroneous way, ultrasonic vibration is not transmitted, and a sufficient effect cannot be obtained. Since a certain level of ultrasonic vibration set by a user is emitted regardless of whether or not the probe contacts the skin, when the probe does not contact the skin, the portion of the probe that transmits vibration is heated due to vibration. When the temperature of this portion of the probe rises, the user may feel uncomfortable. When the device is used for a long period of time, the skin may be burned.

Furthermore, a variety of approaches able to realize a variety of skin care modes using a vibrator vibrating in the vertical direction using a magnetic coil and to provide galvanic massages and iontophoretic massages using the vibrator are disclosed.

However, such approaches of the related art are directed to stimulating the skin by converting the rotating force of a vibration motor into a linear motion or a cam motion. Thus, noises occur while the driving force of the vibration motor is being transmitted, thereby causing discomfort the users of beauty devices. Since vibration is caused by eccentricity, there is a significant amount of diverging force in the horizontal direction, i.e. the direction parallel to the surface of the skin. This reduces an amount of force acting to the surface of the skin in the perpendicular direction. Consequently, massaging is not effectively performed, which is problematic.

In addition, an apparatus of generating sound waves and a device able to generate a sound source based on the principle of an audio speaker have been developed. However, due to certain problems, such as the structural characteristics of a magnetic circuit and the positions of a leaf spring and a coil, the amplitude of frequencies generated thereby is limited, and the intensity thereof is very low. In addition, since a guide using a bearing for maintaining

acoustic vibration in a vertical form as well as a coil spring for maintaining elasticity is required, it is difficult to reduce the size thereof.

Furthermore, it is difficult to effectively care for human bodies using the related-art approaches, since the modes of use and functions thereof are significantly limited. According to the related-art approaches, a user must keep pressing a vibrator against his or her body in order to provide stimulation. Consequently, the user may quickly become tired, which is problematic.

DISCLOSURE

Technical Problem

An object of the present invention is to provide a skin and scalp massaging apparatus including a vibration block using acoustic pressure generated from sound.

Another object of the present invention is to provide a skin and scalp massaging apparatus using acoustic pressure, the apparatus including a vibration probe to which one of a variety of skin and scalp massaging heads is detachably attached and a vibration block efficiently transmitting vibration to the vibration probe.

A further object of the present invention is to provide a skin and scalp massaging apparatus using acoustic pressure, the apparatus having an engagement structure for directly transmitting vibration between a vibration probe and a vibration block.

Technical Solution

In order to achieve the above object, a skin and scalp massaging apparatus according to the present invention is directed to efficiently transmitting vibration using a head detachably attached to a vibration probe engaged with the central portion of a conduit damper of a vibration block. The skin and scalp massaging apparatus provides a variety of uses of massaging skin or scalp. Since the amplitude of vibration generated by the central portion of the conduit damper is greatest, it is possible to improve vibration efficiency for massaging or stimulation by engaging the central portion of the conduit damper of the vibration block with the vibration probe.

According to an aspect of the present invention, a skin and scalp massaging apparatus using acoustic pressure includes: a housing; a vibration block disposed in an inner space of the housing, wherein the vibration member comprises a disk-shaped conduit plate generating vibration in a vertical direction in response to changes in acoustic pressure generated from sound, and a plurality of strip-shaped dampers extending along a circumference of the conduit plate; a vibration probe engaged with the vibration block to be exposed externally from the housing; a connecting member transmitting vibration generated by the vibration block to the vibration block, wherein one end of the connecting member is engaged with the vibration probe, and the other end of the connecting member is engaged with a central portion of the conduit damper; and a head detachably attached to the vibration probe to massage skin or scalp of a human body using vibration received from the vibration probe.

According to an embodiment of this aspect, the vibration probe includes a plate to which the skin or scalp massaging head is detachably attached, and a shaft disposed on a central portion of a bottom surface of the plate, a bottom end of the shaft being engaged with the connecting member.

According to another embodiment, the vibration block includes: a body including a lower body having an opened upper portion and an inner accommodation space and an upper body covering the opened upper portion of the lower body, the upper body having a first engagement hole through which the connecting member extends to be fitted thereinto; a magnetic member disposed within the accommodation space to generate magnetic force; a voice coil disposed around the magnetic member within the accommodation space; an upper plate having a second engagement hole corresponding to the first engagement hole, the connecting member being engaged with the second engagement hole, wherein the upper plate is disposed on top of the voice coil to induce magnetic force from the magnetic member to be concentrated to the voice coil; and a conduit damper having a third engagement hole corresponding to the second engagement hole, the connecting member being engaged with the third engagement hole, wherein the conduit damper is disposed on top of the upper plate, is engaged between the upper body and the lower body, and generates vibration in a vertical direction using an interaction between the magnetic member and the voice coil.

According to a further embodiment, an upper portion of the connecting member is screw-engaged with a bottom end of the shaft, and a lower portion of the connecting member is engaged with the third engagement hole of the conduit damper and the second engagement hole of the upper plate.

According to another embodiment, the vibration block includes: a body including a lower body having an opened upper portion and an inner accommodation space and an upper body covering the opened upper portion of the lower body, the upper body having a first engagement hole through which the connecting member extends to be fitted thereinto; a lower bracket disposed in the accommodation space of the body, with an upper portion and a lower portion of the lower bracket being opened; a magnetic member disposed within the accommodation space to generate magnetic force; a voice coil disposed around the magnetic member within the accommodation space; an upper plate disposed on top of the voice coil to induce magnetic force from the magnetic member to be concentrated to the voice coil; a bobbin having a second engagement hole in a central portion of an upper surface thereof, the connecting member being engaged with the second engagement hole, wherein the bobbin guides the voice coil to be disposed around the magnetic member; a conduit damper having a third engagement hole corresponding to the second engagement hole, the connecting member being engaged with the third engagement hole, wherein the conduit damper is disposed on top of the upper plate to generate vibration in a vertical direction using an interaction between the magnetic member and the voice coil; and an upper bracket engaged with the lower bracket and disposed within the accommodation space of the body, the upper bracket having a fourth engagement hole corresponding to the third engagement hole, the connecting member being fitted into and extending through the fourth engagement hole,

According to a further embodiment, the conduit damper includes: a disk-shaped conduit plate generating vibration in a vertical direction; and a plurality of dampers extending along a circumference of the conduit plate, each of the dampers being an arc-shaped strip that is curved outward, and having a screw-engagement hole in a distal end thereof, wherein the dampers are fixedly engaged between the upper bracket and the lower bracket.

According to another embodiment, an upper portion of the connecting member is screw-engaged with a bottom end

of the shaft, and a lower portion of the connecting member is screw-engaged with the fourth engagement hole of the upper bracket, the third engagement hole of the conduit damper, and the second engagement hole of the bobbin.

According to a further embodiment, the vibration probe has a fixing recess formed in a predetermined position on an outer circumference of the shaft, and the connecting member has an engagement recess in an upper portion thereof into which the shaft is removably fitted, and an elastic fixing pin is fixedly disposed on the connecting member, wherein the elastic fixing pin is seated in or separated from the fixing recess when the shaft is fitted into or separated from the engagement recess.

Advantageous Effects

As set forth above, in the skin and scalp massaging apparatus according to the present invention, the vibration probe is engaged with the central portion of the conduit damper of the vibration block such that vibration is directly transmitted to the vibration probe. Since the amplitude of vibration generated by the central portion of the conduit damper is greatest, vibration efficiency for massaging or stimulation can be improved.

In addition, the skin and scalp massaging apparatus according to the present invention can be applied to a variety of uses of, for example, massaging skin or scalp, since the heads can be detachably attached to the vibration probe.

Furthermore, in the skin and scalp massaging apparatus according to the present invention, the conduit damper has a plurality of dampers and is engaged with the components of the vibration block via the plurality of dampers. Accordingly, the apparatus has a simplified structure, and is easy to assemble.

In addition, in the skin and scalp massaging apparatus according to the present invention, the vibration probe is engaged with the vibration block by screw-engagement or by means of the connecting member engaged with the fixing recess via the elastic fixing pin. Accordingly, the apparatus can be easily mounted, separated, and assembled.

Furthermore, in the skin and scalp massaging apparatus according to the present invention, the vibration block has a plurality of heat dissipation holes, such that heat can be easily dissipated while vibration is being generated.

In addition, in the skin and scalp massaging apparatus according to the present invention, the vibration probe is engaged with the vibration block via the connecting member, such that the vibration probe can be designed and fabricated in a variety of shapes.

DESCRIPTION OF DRAWINGS

FIG. **1** is a perspective view illustrating the configuration of a skin and scalp massaging apparatus according to a first embodiment of the present invention;

FIG. **2** is an exploded perspective view illustrating the configuration of the skin and scalp massaging apparatus illustrated in FIG. **1**;

FIG. **3** is a; perspective view illustrating the configuration of a skin and scalp massaging apparatus according to a second embodiment of the present invention;

FIG. **4** is an exploded perspective view illustrating the configuration of the vibration block according to the first embodiment of the present invention;

FIG. **5** is an exploded perspective view illustrating the configuration of the vibration block according to the second embodiment of the present invention;

FIG. **6** is a view illustrating an assembly structure of a vibration probe and a connecting shaft according to an embodiment of the present invention;

FIGS. **7***a* and **7***b* are views illustrating an assembly structure of a vibration probe and a connecting shaft according to another embodiment of the present invention;

FIG. **8** is a top-plan view illustrating the configuration of the skin and scalp massaging first head illustrated in FIGS. **1** to **3**; and

FIG. **9** is a block diagram illustrating the configuration of the skin and scalp massaging apparatus according to the present invention.

MODE FOR INVENTION

The present invention may be embodied in many different forms and the scope of the present invention should not be construed as being limited to only the embodiments set forth herein. These embodiments are provided so that this disclosure will fully convey the scope of the present invention to those skilled in the art. In the drawings, the shapes and dimensions of components may be exaggerated for the sake of clarity.

Hereinafter, the embodiments of the present invention will be described in detail with reference to FIGS. **1** to **6**.

FIG. **1** is a perspective view illustrating the configuration of a skin and scalp massaging apparatus according to a first embodiment of the present invention, and FIG. **2** is an exploded perspective view illustrating the configuration of the skin and scalp massaging apparatus illustrated in FIG. **1**.

Referring to FIGS. **1** and **2**, the skin and scalp massaging apparatus **100** according to the first embodiment includes a vibration block **150** that generates vibration using acoustic pressure and directly transmits vibration to a vibration probe **120**, to which heads **110** and **110***a* having a variety of uses are detachably attached, in order to massage a person's skin or scalp.

Specifically, the skin and scalp massaging apparatus **100** according to the present embodiment includes housings **102** and **104**, the vibration block **150**, the vibration probe **120**, and selectively one of the heads **110** and **110***a* having different shapes. In addition, the skin and scalp massaging apparatus **100** includes an input part **106**, a waterproof member **130**, a connecting member **140**, a control circuit board **134**, and a display module **132**.

The housings **102** and **104** accommodate the vibration block **150** fixedly disposed in the inner space thereof, and have a first opening **108** and a second opening **105** in partially-opened portions thereof. The first opening **108** allows the vibration probe **120** to be exposed through the outer surface of the housings, and the input part **106** and the display module **132** are mounted into the housings through the second opening **105**. In addition, the control circuit board **134** driving the vibration block **150** in response to acoustic pressure generated using source and the display module **132** displaying the operating state of the skin and scalp massaging apparatus **100** are fixedly disposed in the inner space of the housings **102** and **104**.

The housings **102** and **104** include the upper housing **104** and the lower housing **102**. The upper and lower housings **102** and **104** are engaged with each other, defining the inner space thereof in which the vibration block **150** is fixedly disposed. The upper housing **104** and the lower housing **102** are engaged with each other in a sealing manner by means of a sealing member (not shown) formed of a silicone material.

The control circuit board **134** is fixedly disposed on one inner portion of the lower housing **102**, and the display module **132** is fixedly disposed on the other inner portion of the lower housing **102**. The vibration block **150** is fixedly disposed on the upper portion of the lower housing **102** in which the control circuit board **134** is disposed.

The upper housing **104** has the partially-opened first opening **108** in a position facing the vibration block **150** fixedly disposed in the lower housing **102**. In the first opening **108**, the vibration probe **120** engaged with the vibration block **150** is exposed through the outer surface of the upper housing **102**. A deco-ring is disposed between the circumference of the first opening **108** and the circumference of the head **110** or **110***a* mounted on the vibration probe **120**.

The skin and scalp massaging apparatus **100** according to the first embodiment is provided in the shape in which the vibration probe **120** disposed in the first opening **108** of the upper housing **102** is buried inward from the surface of the upper housing **102**. Thus, the exposed surface of the skin massaging head **110***a* or the scalp massaging head **110** engaged with the vibration probe **120** is provided to be substantially parallel to the surface of the upper housing **102**.

In addition, the upper housing **104** has the second opening **105** below the first opening **108**. The input part **106** and the display module **132** are disposed in the second opening **105**.

The input part **106** includes, for example, a plurality of input buttons, a power switch, and the like. The input part **106** Supplies power to the skin and scalp massaging apparatus **100**, controls the intensity of vibration generated by the vibration block **150**, or controls the operation modes, such as start, pause, or stopping of an operation, of the skin and scalp massaging apparatus **100**.

Different shapes of the heads **110** and **110***a* may be selectively provided in such that the heads **110** and **110***a* can be used for different uses. For example, the heads **110** and **110***a* include the skin massaging head **110***a* and the scalp massaging head **110**. Each of the heads **110** and **110***a* is detachably disposed on the vibration probe **120**. The heads **110** and **110***a* may be formed of a variety of materials, such as a silicone, wood, plastic, and metal. Each of the heads **110** and **110***a* is disposed on the vibration probe **120** to transmit vibration to the skin or the scalp of a human body in order to massage the skin or the scalp.

The bottom surface of the scalp massaging head **110** is fitted into the vibration probe **120**, and a plurality of protrusions **112** and **114** are provided on the top surface of the scalp massaging head **110**. In addition, the surface of the skin massaging head **110***a* that makes contact with the skin is shaped to be substantially flat or is shaped such that the central portion thereof is convexly rounded.

The upper portion of the vibration probe **120** is exposed in the first opening of the housings **102** and **104**, and the lower portion of the vibration probe **120** is engaged with the vibration block **150**. The vibration probe **120** vibrates the head **110** or **110***a* by receiving, vibration directly from the vibration block **150**. The vibration probe **120** includes a plate **122** to which the head **110** or **110***a* is detachably attached and a shaft **124** disposed on the central portion of the bottom surface of the plate **122** and axially engaged with the vibration block **150**. The shaft **124** has a bolt **126** on the bottom end, the bolt **126** being screw-engaged with the vibration block **150**.

The plate **122** of the vibration probe **120** is provided in a position similar to the surface of the circumference of the first opening **108** at a distance from the circumference of the first opening **108**, and is exposed externally from the upper housing **102**. One of the skin massaging head **110***a* and the scalp massaging head **110** is mounted on the plate **122** of the vibration probe **120**.

The waterproof member **130** is disposed between the vibration probe **120** and the vibration block **150**. The waterproof member **130** is fitted around the shaft **124** of the vibration probe **120**, whereby the portion between the vibration probe **120** and the vibration block **150** is maintained waterproof.

The vibration block **150** is disposed in the inner space of the housings **102** and **104**. The vibration block **150** generates vibration in response to changes in acoustic pressure generated from sound, and transmits vibration generated thereby to the vibration probe **120**. The vibration block **150** generates vibration in the vertical direction in response to changes in acoustic pressure. The vibration block **150** has an engagement hole **192** formed in the central portion of the top surface thereof, the engagement hole **192** being engaged with the connecting member **140**. The vibration block **150** has a plurality of heat dissipation holes in the top surface thereof, through which heat is dissipated. The configuration and operation of the vibration block **150** according to the embodiments of the present invention will be described in more detail with reference to FIGS. **4** and **5**.

The connecting member **140** is disposed between the vibration probe **120** and the vibration block **150**. The connecting member **140** is shaft-shaped, the upper portion of the connecting member **140** is engaged with the shaft **124** of the vibration probe **120**, and the lower portion of the connecting member **140** is engaged with the vibration block **150**. In this regard, the connecting member **140** has an engagement recess **142** in the upper portion thereof into which the shaft **122** is engaged and the bolt **144** in the lower portion thereof that is engaged with the vibration block **150**. According to the present embodiment, the engagement recess **142** is configured such that a bolt **126** of the shaft **124** is screw-engaged with the interior thereof. In addition, the vibration block **150** has the engagement hole **192** in the top surface thereof into which the bolt **144** of the connecting member **140** is screw-engaged.

The display module **132** includes, for example, at least one light-emitting diode (LED) on which the input part **106** is disposed. The LED serves to light the input part **106** and the surrounding area. The display module **132** transmits signals generated by the input part **106** to the control circuit board **134**, and turns on and off the LED under the control of the control circuit board **134**.

In addition, the control circuit board **134** controls the overall operations of the skin and scalp massaging apparatus **100**. The control circuit board **134** controls an external power source or a power supply (**136** in FIG. **9**) to supply power to the skin and scalp massaging apparatus **100**, and controls the operation of the skin and scalp massaging apparatus **100** in response to signals output by the input part **106**. In addition, the control circuit board **134** controls the display module **132** to turn on and off the LED.

FIG. **3** is a perspective view illustrating the configuration of a skin and scalp massaging apparatus according to a second embodiment of the present invention. The skin and scalp massaging apparatus **100***a* according to the present embodiment is configured similar to the skin and scalp massaging apparatus illustrated in FIG. **1**. Hereinafter, detailed descriptions will be given with regarding differences.

Referring to FIG. **3**, the skin and scalp massaging apparatus **100***a* according to the second embodiment is configured such that a vibration probe **120***a* protrudes outward

from housings **102** and **104***a*. Specifically, the shape and the size of a first opening of the upper housing **104***a* are determined such that the shaft of the vibration probe **120***a* extends therethrough. The vibration probe **120***a* is also configured such that a head **110** is detachably attached thereto.

In addition, the skin and scalp massaging apparatus **100***a* according to the present embodiment includes an input part **106***a* disposed in a second opening of the upper housing **104***a*, the input part **106***a* having a plurality of input buttons.

FIG. **4** is an exploded perspective view illustrating the configuration of the vibration block according, to the first embodiment of the present invention, and FIG. **5** is an exploded perspective view illustrating the configuration of the vibration block according to the second embodiment of the present invention. The vibration blocks **150** and **150***a* according to these embodiments can be provided in the skin and scalp massaging apparatuses **100** and **100***a* illustrated in FIGS. **1** and **3**.

Referring to FIG. **4**, the vibration block **150** according to the present embodiment includes upper and lower bodies **190** and **152**, a magnetic member **154**, a voice coil **156**, an upper plate **158**, and a conduit damper **170**. The vibration block **150** further includes a waterproof member **196** and a buffer member **180**.

The lower body **152** is opened in the upper portion, and provides an inner space in which the magnetic member **154** and the voice coil **156** are accommodated. The upper body **190** is engaged with the lower body **152**. The upper body **190** covers the open upper portion of the lower body **152**. The upper body **190** has an engagement hole **192** and a plurality of heat dissipation holes **194**. The connecting member **140** and the waterproof member **196** extend through and are fitted into the engagement hole **192**.

The magnetic member **154** is fixedly disposed on the lower body **152**, and interacts with the voice coil **156** to generate a magnetic field. The magnetic member **154** is implemented as a permanent magnet, for example, a neodymium magnet. The voice coil **156** is disposed outside of the magnetic member **154**, and when power is applied thereto, interacts with the magnetic member **154** to generate a magnetic field.

The upper plate **158** is disposed on top of the magnetic member **154** and the voice coil **156**. The upper plate **158** induces magnetic force to be concentrated to the voice coil **156**. The upper plate **158** has an engagement hole **160** in the central portion thereof with which the connecting member **140** is engaged. The upper plate **158** has a plurality of heat dissipation holes **162**.

The conduit damper **170** generates vibration in the vertical direction in response to acoustic pressure in the same manner as a speaker. The conduit damper **170** is disposed on top of the upper plate **158**, and generates vibration in the vertical direction using a magnetic field generated by the interaction between the magnetic member **154** and the voice coil **156**. The conduit damper **170** includes a disk-shaped conduit plate **172** and a plurality of dampers **176** disposed on the circumference of the conduit plate **172**. The conduit plate **172** has an engagement hole **174** in the central portion thereof with which the connecting member **140** is engaged. Each of the dampers **176** is an arc-shaped strip that extends along the circumference of the conduit plate **172** and is curved outward. Each of the dampers **176** has a screw-engagement hole in the distal end thereof. The dampers **176** are fixedly screw-engaged with the top surface of the lower body **152**. The conduit damper **170** directly transmits vibration to the vibration probe **120** via the connecting member **140** engaged with the central portion thereof. When the conduit damper **170** of the vibration block **150** generates vibration using acoustic pressure, the amplitude of vibration is greatest in the central portion of the conduit damper **170**. Thus, the bolt **144** of the connecting member **140** and. the engagement hole **174** of the conduit damper **170** are engaged with each other to transmit vibration, whereby vibration efficiency for massaging or stimulation is maximized.

The buffer member **180** is disposed on top of the conduit damper **170** to buffer impacts such that vibration generated by the conduit damper **170** is not transmitted externally.

In addition, the waterproof member **196** is disposed between the shaft **124** of the vibration probe **120** and the upper body **190**. The shaft **124** extends through the waterproof member **196** and is fixedly fitted into an engagement hole **192** formed in the central portion of the upper body **190**, thereby preventing external liquid or impurities from entering the interior of the vibration block **150**.

In the vibration block **150**, the shaft **124** of the vibration probe **120** extends through the central portion of the upper body **190** and is engaged with the connecting member **140**, and the connecting member **140** is screw-engaged with the central portions of the conduit damper **170** and the upper plate **190**. Consequently, in the vibration block **150**, when the conduit damper **170** generates vibration in the vertical direction using acoustic pressure generated from sound, vibration is transmitted to the vibration probe **120** engaged with the conduit damper **170** via the connecting member **140**.

The second embodiment will be described with reference to FIG. **5**, According to the present embodiment, the vibration block **150***a* includes upper and lower bodies **190** and **152***a*, upper and lower brackets **178** and **153**, a magnetic member **154***a*, a voice coil **156***a*, an upper plate **158***a*, a bobbin **164**, and a conduit damper **170**. Although not shown in the drawings, the vibration block **150***a* may further include a waterproof member and a buffer member, as illustrated in FIG. **4**.

The lower body **152***a* is opened in the upper portion, and has an inner space in which the magnetic member is accommodated. The magnetic member **154***a* is fixedly disposed on the bottom of the inner space of the lower body **152***a*. In addition, a lower bracket **153** is disposed in the lower body **152***a*, in a position surrounding the magnetic member **154***a*. The upper body **190** is engaged with the lower body **152***a*, thereby covering the open upper portion of the lower body **152***a*.

The upper portion and the lower portion of the lower bracket **153** are opened. The lower bracket **153** is disposed within the lower body **152***a*, with the top surface thereof being engaged with the conduit damper **170**. The upper bracket **178** is disposed within the upper body, and is engaged with the upper portion of the lower bracket **153**. The bottom surface of the upper bracket **178** is screw-engaged with the conduit damper **170** and the lower bracket **153**.

The magnetic member **154***a* is fixedly disposed in the lower body **152***a* to interact with the voice coil **156***a* to generate a magnetic field. The magnetic member **154***a* is implemented as a permanent magnet, for example, a neodymium magnet. The voice coil **156***a* is disposed outside of the magnetic member **154***a*, and when power is applied thereto, interacts with the magnetic member **154***a* to generate a magnetic field. The magnetic member **154***a* and the voice coil **156***a* are disposed within the upper and lower brackets **178** and **153**, which enhance the efficiency of generation of the magnetic field.

The upper plate **158***a* is disposed on top of the magnetic member **154***a* and the voice coil **156***a*, and is positioned in the inner diameter portion of the bobbin. The upper plate **158***a* induces magnetic force generated by the magnetic member **154***a* to be concentrated to the voice coil **156***a*.

The bobbin **164** is engaged with the vibration probe **120**. The bobbin **164** guides the voice coil **156***a* to be reliably disposed outside thereof, and prevents the voice coil **156***a* from being dislodged. The bobbin **164** has an engagement hole **166** in the central portion of the upper surface with which the connecting member **140** is engaged and a plurality of heat dissipation holes surrounding the engagement hole **166**. The heat dissipation holes function to reduce noise when vibration is generated while performing a heat dissipation function. In addition, the bobbin **164** dissipates heat generated by the voice coil **156***a*.

The conduit damper **170** is disposed on top of the bobbin **164**, and generates vibration in the vertical direction using a magnetic field generated by the interaction between the magnetic member **154** and the voice coil **156**. The conduit damper **170** includes a conduit plate **172** and a plurality of dampers **176**. The conduit plate **172** has an engagement hole **174** in the central portion thereof with which the connecting member **140** is engaged. Each of the dampers **176** is an arc-shaped strip that extends along the circumference of the conduit plate **172** and is curved outward. Each of the dampers **176** has a screw-engagement hole in the distal end thereof. The dampers **176** are fixedly screw-engaged between the upper and lower brackets **178** and **153**. The conduit damper **170** directly transmits vibration to the vibration probe **120** via the connecting member **140** engaged with the central portion thereof. Since the amplitude of vibration is greatest in the central portion of the conduit damper **170**, a bolt **144** of the connecting member **140** and the engagement hole **174** of the conduit damper **170** are engaged with each other to transmit vibration to the vibration probe **120** via the connecting member **140**.

Thus, in the vibration block **150***a* according to the present embodiment, the shaft **124** of the vibration probe **120** extends through the central portion of the upper body **190** and is engaged with the connecting member **140**, and the connecting member **140** is screw-engaged with the central portions, of the upper bracket **178**, the conduit damper **170**, and the bobbin **164** through engagement holes **179**, **174**, and **166**, respectively. Consequently, in the vibration block **150***s*, when the conduit damper **170** generates vibration in the vertical direction using acoustic pressure generated from sound, vibration is transmitted to the vibration probe **120** engaged with the conduit damper **170** via the connecting member **140**.

FIG. **6** is a view illustrating an assembly structure of a vibration probe and a connecting shaft according to an embodiment of the present invention, and FIGS. **7***a* and **7***b* are views illustrating an assembly structure of a vibration probe and a connecting shaft according to another embodiment of the present invention.

First, referring to FIG. **6**, the vibration probe **120** according to the present embodiment is screw-engaged with the connecting member **140** by means of the bolt **126** of the shaft **124**, with the bolt **144** of the connecting member **140** being screw-engaged with the central portion of the conduit plate **172**, the upper plate **158**, or the bobbin **164** of the vibration block **150***a*, as illustrated in FIGS. **1** to **5**, in order to directly receive vibration generated by the conduit damper.

Referring to FIGS. **7***a* and **7***b*, the vibration probe **120** according to the present embodiment has fixing recesses **125** in specific positions of the outer circumference of the shaft **124***a*. Elastic fixing pins **146** are fixedly disposed on the connecting member **140***a*, the elastic fixing pins **146** being removably fitted into the fixing recesses **125**.

Each of the fixing recesses **125** has a catching stepped portion on the upper portion and a guide on the lower portion. In addition, each of the elastic fixing pins **146** is fixed in an outside position such that a portion thereof is exposed within the corresponding engagement recess **142** of the connecting member **140**. The exposed portion of each elastic fixing pin **146** is fitted into or separated from the corresponding fixing recess **125** of the shaft **124***a*.

The fixing recess **125** is configured such that, when the shaft **124***a* of the vibration probe **120** is pressed downwards to be fitted into the engagement recess **142** of the connecting member **140***a*, each elastic fixing pin **146** is guided by a guide to be seated in the fixing recess **125**, and at the same time, the elastic fixing pin **146** is fixedly held by the catching stepped portion. In addition, when the shaft **124***a* is pressed upwards to be separated from the engagement recess **142** of the connecting member **140***a*, each elastic fixing pin **146** is easily separated from the fixing recess **125** by means of the guide.

According to the present embodiment, the vibration probe **120** can be engaged with and separated from the vibration block **150** more easily than in the case of screw engagement illustrated in FIG. **6**. It is also possible to prevent threads from damage that would otherwise occur as the vibration probe **120** is multiply engaged with and separated from the vibration block **150**.

Thus, the vibration probe **120** according to the present invention can be easily fabricated and assembled since the connecting member **140** or **140***a* is screw-engaged therewith or is engaged therewith using the fixing recesses **125** and the elastic fixing pins **146**.

In addition, although the vibration probe **120** according to the present invention is engaged with the vibration block **150** or **150***a* using the connecting member **140** or **140***a*, the bolt **126** disposed on the shaft **124** or **124***a* of the vibration probe **120** can be directly engaged with the vibration block **150** or **150***a*.

FIG. **8** is a top-plan view illustrating the configuration of the skin and scalp massaging first head illustrated in FIGS. **1** to **3**.

Referring to FIG. **8**, the scalp massaging head **110** has a plurality of protrusions **112** and **114** disposed on the scalp-abutting top surface **111** in order to massage the scalp.

According to the present embodiment, the protrusions **112** and **114** protrude in the shape of cones from the top surface of the head **110**, and are arranged radially. The central protrusions **112** and the circumferential protrusions **114** have different sizes. The bottom surfaces of the protrusions **112** and **114** are substantially circular. The circumferential protrusions **114** on the top surface **111** have a larger cross-sectional area and a greater height than the central protrusions **112** on the top surface **111**. Alternatively, the protrusions **112** and **114** may have uniform sizes and heights.

Subsequently, FIG. **9** is a block diagram, illustrating the configuration of the skin and scalp massaging apparatus according to the present invention.

Referring to FIG. **9**, the skin and scalp massaging apparatus **100** or **100***a* according to the present invention includes the vibration probe **120** or **120***a*, the vibration block **150** or **150***a*, the input part **106** or **106***a*, the display part **132**, a sound source **200**, a power supply **136**, and a control part **134**.

As described above, the skin and scalp massaging head **110** or **110***a* is detachably attached to the vibration probe **120** or **120***a* according to a variety of applications. The vibration probe **120** or **120***a* is engaged with the central portion of the conduit damper **170** of the vibration block **150** or **150***a* that generates vibration via the connecting member **140** or **140***a*, such that vibration is transmitted to the vibration probe **120** or **120***a*.

The input part **106** or **106***a* includes a plurality of input buttons, such that a user operates the skin and scalp massaging apparatus **100** or **100***a* by manipulating the buttons of the input part **106** or **106***a*. The display part **132** is implemented as a display module, and includes at least one LED. Alternatively the display part **132** may be implemented as a liquid crystal display (LCD) panel.

The sound source **200** is implemented as a portable memory device or an interface device receiving sound from an external sound generating device. The sound source **200** allows the vibration block **150** or **150***a* to generate vibration from sound. Examples of the external sound generating device may include a computer, a smartphone, an MP3 player, a portable media player (PMF), a compact disk (CD) player, and a digital TV. The interface device may be implemented as one selected from among a universal serial bus (USB) memory socket, a portable memory socket, an auxiliary (AUX) receiver able to transmit data using wired/wireless, communications networks, a USB connector, a WiFi receiver, a Bluetooth receiver, and the like.

The power supply **136** is implemented as, for example, a rechargeable battery that can be charged using electric power supplied from an external power source. The power supply **136** supplies power to the skin and scalp massaging apparatus **100** or **100***a* under the control of the control part **134**.

The control part **134** is implemented as the control circuit board **134** to control the overall operations of the skin and scalp massaging apparatus **100** or **100***a*. The control part **101** controls power to be supplied to skin and scalp massaging apparatus **100** from the external power source or the power supply **136**, and controls the operations of the skin and scalp massaging apparatus **100** to be performed in response to signals output by the input part **106** or **106***a*. In addition, the control part **134** controls the display module **132** to display various types of information in response to the operating states of the skin and scalp massaging apparatus **100**.

As set forth above, the skin and scalp massaging apparatus **100** or **100***a* according to the present invention includes the vibration block **150** or **150***a* generating vibration from sound, the vibration probe **120** or **120***a* directly receives vibration from the vibration block **150** or **150***a*, and the plurality of heads **110** and **110***a* detachably attached to the vibration probe **120** or **120***a*.

The skin and scalp massaging apparatus **100** or **100***a* according to the present invention further includes the conduit damper **170** generating vibration in the vibration block **150** or **150***a*, In which the connecting member **140** or **140***a* is engaged with the central portion of the conduit damper **170**, such that vibration is transmitted to the vibration probe **120** or **120***a* via the connecting member **140** or **140***a*.

Although the configurations and operations of the skin and scalp massaging apparatus according to the present invention have been disclosed with reference to the detailed description and the drawings, they are merely illustrations of the embodiments. Various modifications and alterations are possible, without departing from the scope and spirit of the present invention.

The invention claimed is:

1. A skin and scalp massaging apparatus using acoustic pressure, comprising:

a housing;

a vibration block disposed in an inner space of the housing and comprising a conduit damper, wherein the conduit damper comprises:

a disk-shaped conduit plate generating vibration in a vertical direction in response to changes in acoustic pressure generated from sound; and

a plurality of strip-shaped dampers extending along a circumference of the conduit plate;

a vibration probe engaged with the vibration block to be exposed externally from the housing;

a connecting member transmitting the vibration generated by the vibration block to the vibration probe, wherein one end of the connecting member is engaged with the vibration probe, and another end of the connecting member is engaged with a central portion of the conduit damper; and

a head detachably attached to the vibration probe to massage skin or scalp of a human body using the vibration received from the vibration probe.

2. The skin and scalp massaging apparatus according to claim **1**, wherein the vibration probe comprises:

a plate to which the head is detachably attached; and

a shaft disposed on a central portion of a bottom surface of the plate, a bottom end of the shaft being engaged with the connecting member.

3. The skin and scalp massaging apparatus according to claim **2**, wherein the vibration block further comprises:

a body comprising a lower body having an opened upper portion and an inner accommodation space, and an upper body covering the opened upper portion of the lower body, the upper body having a first engagement hole through which the connecting member extends to be fitted thereinto;

a magnetic member disposed within the inner accommodation space to generate magnetic force;

a voice coil disposed around the magnetic member within the inner accommodation space;

an upper plate having a second engagement hole corresponding to the first engagement hole, the connecting member being engaged with the second engagement hole, wherein the, upper plate is disposed on top of the voice coil to induce magnetic force from the magnetic member to be concentrated on the voice coil; and

the conduit damper having a third engagement hole corresponding to the second engagement hole, the connecting member being engaged with the third engagement hole, wherein the conduit damper is disposed on top of the upper plate and engaged between the upper body and the lower body to generate vibration in a vertical direction using an interaction between the magnetic member and the voice coil.

4. The skin and scalp massaging apparatus according to claim **3**, wherein an upper portion of the connecting member is screw-engaged with the bottom end of the shaft, and a lower portion of the connecting member is engaged with the third engagement hole of the conduit damper and the second engagement hole of the upper plate.

5. The skin and scalp massaging apparatus according to claim **2**, wherein the vibration block comprises:

a body comprising a lower body having an opened upper portion and an inner accommodation space, and an upper body covering the opened upper portion of the

lower body, the upper body having a first engagement hole through which the connecting member extends to be fitted thereinto;

a lower bracket disposed in the inner accommodation space of the body, with upper and lower portions of the lower bracket being opened;

a magnetic member disposed within the inner accommodation space to generate magnetic force;

a voice coil disposed around the magnetic member within the inner accommodation space;

an upper plate disposed on top of the voice coil to induce magnetic force from the magnetic member to be concentrated on the voice coil;

a bobbin having, a second engagement hole in a central portion of an upper surface thereof, the connecting member being engaged with the second engagement hole, wherein the bobbin guides the voice coil to be disposed around the magnetic member;

the conduit damper having a third engagement hole corresponding to the second engagement hole, the connecting member being engaged with the third engagement hole, wherein the conduit damper is disposed on top of the upper plate to generate vibration in a vertical direction using an interaction between the magnetic member and the voice coil; and

an upper bracket engaged with the lower bracket and disposed within the inner accommodation space of the body, the upper bracket having a fourth engagement hole corresponding to the third engagement hole, the connecting member being fitted into and extending through the fourth engagement hole.

6. The skin and scalp massaging apparatus according to claim **5**,

wherein

each of the dampers is an arc-shaped strip that is curved outward, and has a screw-engagement hole in a distal end thereof, and

wherein the dampers are fixedly engaged between the upper bracket and the lower bracket.

7. The skin and scalp massaging apparatus according to claim **6**,

wherein an upper portion of the connecting member is screw-engaged with the bottom end of the shaft, and

wherein a lower portion of the connecting member is screw-engaged with the upper bracket through the fourth engagement hole, the conduit damper through the third engagement hole, and the bobbin through the second engagement hole, using a bolt at the lower portion of the connecting member.

8. The skin and scalp massaging apparatus according to claim **2**,

wherein the vibration probe has a fixing recess formed in a predetermined position on an outer circumference of the shaft,

wherein the connecting member has an engagement recess in an upper portion thereof into which the shaft is removably fitted, and

wherein an elastic fixing pin is fixedly disposed on the connecting member, and seated in or separated from the fixing recess when the shaft is fitted into or separated from the engagement recess.

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